Tasks Needed to Complete Baltimore Harbor TMDLs

Presented to:

Baltimore Harbor SAG

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Overview

- Review components of a typical TMDL analysis.
- Provide status update on major TMDL components for Baltimore Harbor.
- Discuss how much work is left in next few months.
- Review MDE timeline for TMDL submission (December 2003).

Major TMDL Components

- Task 1 –Water Quality Description
- Task 2 – Impairment Identification
- Task 3 – Water Quality Endpoint
- Task 4 – Development of TMDLs and Allocations
- Task 5 – Assurance of Implementation
- Task 6 – Documentation
- Task 7 – Review

Task 1: Water Quality Description

- Source Assessment (Account for All Sources)
  - Assess point and nonpoint sources to Harbor
    - Terrestrial NPS load provided by watershed modeling (Land use incorporated into NPS load development)
    - Atmospheric NPS –
      - Watershed models – Metals loads implicitly included in loading rate and CBP loading rates were used for nutrients
      - Water quality – Excluded from models due to size of waterbody
    - PS load quantified from PCS database – complete
    - Harbor Mouth Boundary – Net source/sink? TBD
    - Bottom Sediments – Considered endpoint, not source

Task 1: Water Quality Description

- Data Assessment
  - Water Quality Data for 303d Listing - Complete
  - NPS Integrated by Watershed Model - Complete
  - Point Source Data – Complete
  - Data for WQ/Hydro Model Development – Complete

Task 1: Water Quality Description

- Characterization of Water Quality
  - Identify parameters of concern – complete
    - Toxics – Cr, Pb, Zn, TSS, and Flow
    - Nutrients – N, P, C, BOD, DO, Chl-a and Flow
  - Develop understanding of Harbor hydrodynamics
  - Develop understanding of sediment transport

Broad Conceptual Framework

Source Side

Receptor Side

Impairing Substance ◣ ◢ **Water Quality Criteria**

TMDL
QUANTIFIED

Criterion Threshold
QUANTIFIED

Cause **LINKAGE** **Effect**

MDE

Task 2: Identify Water Quality Impairments

- 303(d) Listing Determination:
  - WQ Standard impaired – complete
    - Sediment impairment due to toxic substances
    - DO & Chl a impairments due to nutrients
  - Toxics criteria for metals
    - Sediment Triad
    - Water Column Conc. (No Impairment)
  - DO criteria
    - Greater than 5.0 mg/L surface
    - Natural Conditions (Stratification)
  - Chlorophyll *a*
    - Less than 50 ug/l

Task 3: Water Quality Endpoints

- TMDL Analysis Water Quality Targets:
  - Consistent with 303(d) Determination
  - Limited by Analysis Framework
  - Toxics thresholds for metals in Sediments
    - Mean ERM-Q < 0.5
    - ERMs < 2.0
  - DO criteria
    - Greater than 5.0 mg/L Surface
    - Natural Conditions (Stratification)
  - Chlorophyll *a*
    - Less than 50 μg/l

Task 4: Development of TMDLs and Allocations

- Analysis Tools (Linkage) – to be finalized
  - Allows MDE to estimate the environmental response to load change.
  - Watershed models integrate hydrology, NPS & PS.
  - Models used to simulate Harbor environment:
    - Hydro/Sediment Transport Models {UMD, VIMS}
    - Toxics WQ Box Model {UMD}
    - Toxics WQ Model {VIMS}
    - Eutrophication WQ Model {VIMS}

Task 4: Development of TMDLs and Allocations (Con't)

- Analysis Approach – to be finalized
  - Address Bottom Sediments
  - Consider Existing Cases {e.g., Bellingham, WA}
  - Scenario Development, examples:
    - Assess Potential Legacy Issues
    - Assess Long-term Sediment Concentrations
    - Assess Relative Importance of Source Categories

Task 4: Development of TMDLs and Allocations (Con't)

- Scenario Results - TBD
  - Will assist MDE in making management decisions.
  - Results should provide insight into how pollutant loads into the harbor affect water quality.
- Loading Caps - TBD
  - Caps = total quantity of substance that can be discharged into waterbody and still maintain WQ standard.
  - Caps are objective evaluation of a what is required to maintain water quality in a given body of water.

Task 4: Development of TMDLs and Allocations (Con't)

- Allocations – TBD
  - Allocations are subjective
    - There is more that one way to skin a cat
  - Based on scenario runs MDE will make allocations between
    - Point sources
    - Nonpoint sources
    - Margin of safety
    - Future Allocations?

Task 5: Assurance of Implementation

- Assurance of Implementation – TBD
  - This section of TMDLs describes the programs that will be utilized to ensure TMDLs are achieved and maintained (e.g., stormwater permits, 319 $, WRAS implementation, NPDES program, use of pollution prevention, etc.)

Task 6 & Task 7: Documentation & Review

- Draft document must be completed by **August 1st**
- Review Steps:
  - Internal
  - Interagency
  - EPA Preliminary
  - Public Comment

Timeline & Next Steps**

- ****Schedule based on completion of acceptable modeling tools**
- March - August 2003 to do list:
  - March
    - Finalize model development & run scenarios
  - April/May
    - Finalize scenarios & develop loading caps
  - May/June
    - Develop Loading Limits & Allocations
  - July
    - Draft Report
  - August
    - Start Review Process

SAG Participation in Completion of Harbor TMDLs

Key Decision Points

- PS and NPS Load Estimates
- Water Quality Endpoint
- TMDL Development
- Allocations

PS Load Estimates

- PS load estimates & data have been reviewed (Toxics & Nutrients):
  - Provided to dischargers for review.
  - Dischargers have provided comments.
  - Process for computing loading estimates provided to SAG at previous meetings.
  - Estimates available for public review.

NPS Load Estimates

- NPS load estimates generated through watershed models have been reviewed (Toxics & Nutrients):
  - Reviewed and accepted by,
    - Technical Subgroup of SAG
    - Bay Program Modeling Subcommittee
    - Local Governments
  - Reports are considered final – reports available upon request

SAG Participation Pts.

- Water Quality Endpoints
  - Review and advise MDE.
- Analysis Framework
  - Review and advise MDE on approach used to complete TMDLs (e.g., use of models, Bellingham Bay approach, etc.)

SAG Participation Pts.

- Scenario Development
  - Advise MDE on issues of concern regarding model scenario inputs
- Allocation Development
  - Advise MDE on issues of concern regarding allocation approaches
- Participate in Public Review Process

Questions/Comments/Concerns